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Use of EU structural funds for sustainable energy development in new EU member states

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Abstract

More wide use of renewable energy sources (RES) and increase in energy supply and use efficiency can make a valuable contribution to the meeting sustainable energy development targets. The article presents a detailed overview of possibilities to use the EU Structural Funds available for new member states (NMS) to finance sustainable energy projects and to overcome market failures related with negative externalities of pollution, positive externalities of knowledge and adoption of new pollution reduction technologies and incomplete information. The analysis of current situation of the use of EU Structural funds (SF) for the implementation of sustainable energy projects in Lithuania, Poland and Check Republic was performed based on RUSE project results. The proposals to enhance use of SF for sustainable energy projects in NMS were developed.

Keywords: EU structural funds; Financing of renewable energy projects in new member states

Contents

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1. Introduction

New context of energy sector development with clear directions and targets defined by EU directives forces to solve mutually three main energy problems: competitiveness of energy markets, security of energy supply and environmental protection. These targets and measures aiming to implement them sometimes are conflicting. The big challenges are created by solving problems of energy supply security and competitiveness [1]. The fundamental target of electricity market liberalization aiming to increase the competitiveness of Europe has not served the purpose of security of supply and environmental protection. The main reasons are a lot of not that related policies, initiatives and directives across the Europe and achievement of three main purposes in parallel one complicated because different economic and legal tools, measures and mechanisms sometimes conflicting with each other are used. The sustainable growth in this area can only be achieved through a regulatory framework, which complies with the rules of a competitive market. Maintaining that support schemes for renewable energy sources (RES) therefore have to be market based, capital efficient and designed to avoid market distortions.

Creation of competitive energy market is very favorable for the increase in economic growth however security of energy supply, mitigation of environmental impact and energy affordability are the targets of sustainable energy development which can be achieved only by implementation of Government wise energy policy. Therefore the main role of the Government is reorienting energy policy towards sustainable development [2].

There are at least three market failures which hamper sustainable energy development: negative externalities caused by pollution or external costs, positive externalities associated with innovations and diffusion of new environmentally friendly technologies including energy efficiency (EE) improvements and use of RES and the problem of incomplete information or asymmetry of information.

In the case of pollution as an externality, the polluter gets the benefits derived from polluting and imposes the pollution costs on others. In the case of new environmentally friendly technologies, the problem is reversed. A firm investing in or implementing new technologies typically generates benefits for others and incurs all the costs. The positive externality of innovation comes from the public-good nature of new knowledge-innovating firms cannot keep other firms from also benefiting from their new knowledge and therefore cannot capture for themselves all the benefits of the innovation. Of course successful innovator captures some rewards but these rewards will make just a fraction of overall benefits to society of the innovation.

As it takes time for potential users to learn new technologies, try them and adapt to their circumstances, and become convinced of its superiority an important tool in this learning process is the observation of the adoption of the new technologies by others. Therefore the adopter of a new technology creates a positive externality for others in the form of the generation of information about the existence, characteristics, and success of the new

technology. The production costs of new technology tend to fall than manufacturers gain production experience. Therefore innovating firm benefits others manufacturers without compensation and it can also be treated as additional adoption externality [3].

Both innovation and diffusion of new environmentally friendly technologies are characterized by additional market failures related to incomplete information. Information about prospects for success of given technology is asymmetric, in the sense that the developer of the technology is in a better position to assess its potential than outsiders. A firm willing to raise investment capital to fund development of new technology will therefore finds such investors sceptical about promised returns trying to demand premium for their investments allocated for risky business. This imperfection in the market of capital for funding of new technology development and diffusion requires state interventions in promotion of new environmentally friendly, energy efficient technologies. The market failures with respect to adoption of new technologies are part of explanation for the paradox of underinvestment in energy saving technologies that are cost-effective but are not fully utilized [4].

Therefore the interplay of new technologies and the environment involves the interaction of two sets of market failures. The result of these interactions is that the rate of investments in environmentally friendly technologies including EE improvements and use of RES is below the socially optimal level because in the absence of public policy environmentally friendly technologies are doubly underpowered by markets (non-integrated external costs of pollution and non-integrated external benefits of innovation and diffusion of new technologies).

Development of RES and combined heat and power (CHP), implementation of climate change policies, improving EE and ensuring security of energy supply are all necessary elements of a sustainable energy development that will not necessary be delivered by market forces alone. Economic tools and other state policies should be used to address these issues [5]. However economic tools creating initiatives to reduce pollution are not enough to overcome market failures related to implementation of environmentally friendly technologies. Very important issue is the financing of sustainable energy development process or promoting investments in clean, energy efficient technologies. The huge role in this field can be played by EU Structural funds however their use in new member states (NMS) needs more rationality and more orientation towards sustainable energy development.

It should be emphasized that these sustainable energy development problems related with market failures needs to be solved in integral way. Sustainable development needs organizing and implementing institutions, actors, support measures, etc. The main essence of all relevant to energy sector EU directives, policies and measures is to overcome energy market failures: regulation of monopolies in energy sector, dealing with energy externalities, energy affordability, asymmetry of information and energy security [6].

2. Market failures and sustainable energy development

As it was described in the introduction a set of market failures and market barriers limits the development of renewables unless special policy measures are enacted to encourage that development. These barriers are the following:

- commercialization barriers for new technologies competing with old technologies,

- price distortions from existing subsidies between renewables and other energy sources,
- market failures to value the public benefits of renewables,
- asymmetry of information,
- lack of access to capital,
- "split incentives" between building owners and tenants, and high transaction costs for making small purchases.

Many of the benefits of renewables are the public benefits that accrue to everyone. For example, those who choose RES reduce pollution for everyone and provide an environmental benefit to the all society. A customer who is willing to pay more for electricity from RES still has to breathe the same air as the neighbour who might choose not to pay more.

Employment, fuel diversity, price stability, and other indirect economic benefits of RES are being provided for the society as well. For example, for a large industrial customer, it may make more sense to risk moving to another region in response to increases in fuel prices rather than pay more for renewables to stabilize regional prices. While this strategy may benefit the individual firm, it is likely to hurt the region's long-term economic competitiveness. In the same way, firms that can pass on increases in energy costs to customers may also lack an incentive to diversify fuel sources, even though investment in RES would stabilize prices over the longer term.

Research and development that produces societal benefits are also undervalued by markets. The socially desirable level of innovations, research will not be reached because investments probably shift to those areas with the fastest payback. For these reasons, renewables will be unable to compete on a level playing field with conventional generation until new policies are adopted to internalize the social costs of fossil fuel sources. Emission fees or caps on total pollution, with tradable emission permits, are examples of ways to internalize the costs of pollution, increasing competitiveness of renewables. However environmental policies restricting pollution and implementing economic tools do not overcome all market failures hampering development of RES and additional measures to promote investments in environmentally friendly technologies are needed.

Renewable energy technologies also face considerable barriers in market transactions. Customers may have insufficient information to make informed choices. Most utilities provide little information about their emissions or the fuels they use. Because renewable technologies are relatively new, most customers know little about them. They do not know that for example RES technologies can be highly reliable when combined with other options.

Commercial and industrial customers are also generally unfamiliar with renewables and have institutional barriers to purchasing renewables. Industrial energy managers are trained only to find low-cost solutions. RES projects and companies are generally small. Thus they have fewer resources than large generation companies or integrated utilities [7]. These small companies are less able to communicate directly with large numbers of customers. And they are less able to participate in regulatory or legislative proceedings, or in industry forums defining new electricity market rules. Besides that small projects have high transaction costs. In addition to having higher transaction costs, financial institutions are generally unfamiliar with the new technologies and likely to perceive them as risky, so that they may lend money at higher rates. High financing costs are especially significant to

the competitive position of renewables, since RES generally require higher initial investments than fossil fuel plants, even though they have lower operating costs.

When renewables are used locally to provide power to individual buildings and businesses through photovoltaic, fuel cells, or small wind turbines, they encounter additional market barriers. Landlords own some of the most cost-effective building sites, but are unlikely to install equipment just so tenants can realize energy savings. And tenants may not have the right to modify the property or the interest in making a long-term investment. This creates a problem of principal agent and describes the paradox why efficient energy saving technologies are not widely spread.

Therefore the additional to fiscal measures financial mechanisms are needed to maximize the public benefits related to RES, and ensure appropriate investments in sustainable energy development options [8].

3. Measures to overcome market failures and promote RES

Policies that internalize external costs of pollution stimulate the creation of environmentally friendly technologies by increasing the demand for low-cost pollution reduction methods. The growth of demand increases the return to developing such technologies. Government can also stimulate innovation through supply side either by demand side by making it less expensive for firms to undertake research in this area or by performing the research in public institutions. As the government can be treated as a very large landlord, vehicle operator and user of many kinds of equipment, its decision to purchase certain technologies for its own use has significant effects on the rate of diffusion.

The main economic policies and fiscal measures having impact on RES are: pollution taxes, fuel taxes, VAT and excise tax allowances for RES, feed-in prices for electricity produced from RES, GHG emission and green certificate trading schemes which can be voluntary or obligatory [9]. These fiscal measures do not provide sufficient initiatives for the sustainable energy development because deal just with one market failure—negative externalities of pollution; however, other market failures (positive externalities of innovations and diffusion of environmentally friendly technologies and asymmetry of information) are also need to be dealt. Therefore it is necessary to develop and implement policies aiming directly at encouraging the development and diffusion of environmentally friendly technologies. The public support is necessary for technology innovation and diffusion.

Government must engage in technology policy and try a variety of ways to structure policy in this area to minimize the known policy problems. Such popular models for government support new technologies: funding of research and development, public-private partnerships, creation of industrial clusters, green purchase agreements than Government initiates the purchase of environmentally friendly technologies, tax credits that reduce price of new equipment which meets certain criteria, direct technology subsidies, educational programmes, awareness rising campaigns.

Though the major aspect of market failure in technology diffusion is imperfect information, educational programmes alone produce limited diffusion of green technologies. For this purpose enhanced financing of environmentally friendly technologies including EE measures, use of RES, etc. is necessary seeking to overcome energy market failures and barriers. Very useful tool from this point is EU Structural Funds. These funds can be used effectively by NMS to overcome a set of market failures: financing of

innovations and diffusion of new environmentally friendly technologies, including energy saving measures, use of RES, financing research and development, establishing industrial clusters and technological centres, information dissemination, etc.

Finally there are command and control methods forcing the diffusion of environmentally friendly technologies by designing and implementing new efficiency standards in cars, home appliances, building codes, etc.

4. EU structural funds

4.1. The aim of structural funds

Structural Funds are the European Union's main instruments for supporting social and economic restructuring across the Union. They account for over a third of the European Union budget. There are four Structural Funds: ERDF, ESF, EAGGF and FIFG, which contribute to the economic development of disadvantaged regions. A region may have access to one or more of the four structural funds, depending whether it has Objective 1 or 2 status; all regions have Objective 3 status. The aims of the funds, and in which priority 'Objective' area they can be spent, are set out below:

The European Regional Development Fund (ERDF) aims to improve economic prosperity and social inclusion by investing in projects to promote development and encourage the diversification of industry into other sectors in areas lagging behind. This fund is available in Objective 1 and 2 areas.

The European Social Fund (ESF) funds training, human resources and equal opportunities schemes to promote employability of people in both Objective 1 and 3 areas. In Objective 2 areas ESF may be used to complement the ERDF activities.

The European Agricultural Guidance and Guarantee Fund (EAGGF) is available in rural Objective 1 areas to encourage the restructuring and diversification of rural areas, to promote economic prosperity and social inclusion, whilst protecting and maintaining the environment and our rural heritage. In areas outside Objective 1, the EAGGF (Guarantee section) provides funding within the England Rural Development Plan.

The Financial Instrument for Fisheries Guidance (FIFG) funds projects to modernize the structure of the fisheries sector and related industries and to encourage diversification of the workforce and fisheries industry into other sectors. It also aims to ensure the future of the industry through achieving a balance between fisheries resources and their exploitation.

Most structural fund spending is targeted on specific regions, known as Objective 1 and 2 regions. There are separate national Objective 3 programmes in England, Wales, Scotland and Northern Ireland. The national and regional bodies responsible have been preparing the new programmes for the UK for 2000–2006. The programmes must be approved by the Commission; set out below are the various stages in the approval process that programmes have reached.

Objective 1: Eligible areas are those that have less than 75% of EU average GDP. It is the highest level of regional funding available from the EU. It is aimed at promoting the development and structural adjustment of the EU regions most lagging behind in development.

Objective 2: Aims to support the economic and social conversion of areas facing structural difficulties. It is the second highest level of funding available from the EU. Areas qualify for Objective 2, under four strands—industrial, rural, urban and fisheries.

Objective 3: This Objective involves only the European Social Fund. It aims to develop labour markets and human resources and in addition, will help firms and workers adapt to new working conditions and so compete more effectively in global labour markets. It is directed at the long-term unemployed and those facing particular barriers to finding fulfilling employment because of their disability, racial origin, or sex.

In addition to the priority Objective areas around 5% of the Structural Fund budget will fund four Community Initiatives. The current initiatives are:

- *EQUAL*—funds training and employability schemes to combat discrimination and inequalities in the labour market;
- *LEADER+*—funds rural development projects;
- *INTERREG III*—provides funding to encourage cross border, trans-national and interregional co-operation; to encourage balanced and sustainable development across the European Community.
- *URBAN II*—funds schemes in small and medium sized towns suffering from significant economic and social conversion difficulties.

A National Plan is submitted by national government to the European Commission in support of its request for aid from the Structural Funds. For the purpose of consultation the countries are usually divided into sub-regions. The Plan generally proposes actions to improve the productive capacity of the economy; to encourage competitiveness and efficiency; to exploit the development potential of local initiatives, including area-based approaches targeted at disadvantaged areas; to develop skills and aptitudes of those seeking work; and to integrate those who are marginalized and disadvantaged into the workforce.

The official agreement between the Commission and the national governments on the amount and form of EU assistance for the National Development Plan takes the form of a Community Support Framework (CSF). The CSF contains a clause on environmental policy which states that all activities receiving EU funds must be in keeping with EU law and policies, including those on environmental protection. Member States are also obliged to supply the Commission with the appropriate information to enable them to evaluate the impact of operations or measures likely to have a significant impact on the environment.

The individual strategies outlined in the CSF, which in turn were based on the strategies outlined in the National Development Plan, are given practical expression by operational programmes (OPs) which set out in more detail the particular measures which are assisted by the Structural Funds. The programmes are approved by the Commission and form the legal basis for the draw-down of assistance from the EU. Each programme is drawn up by the relevant Government Department or official agency.

4.2. RUSE project and imperfect information

An INTERREG IIIC Programme project *R*edirecting *U*rban areas development towards *S*ustainable *E*nergy (*RUSE*) has been launched in order to transfer experience of EU15 to the NMS in field of sustainable energy projects, financed by SF. In this project the exchange of experiences represent a very important European Added Value (EAV).

Since 2004, the Structural Funds are available in the NMS and are clearly an opportunity for linking sustainable energy and urban development by creating and

stimulating the integration of energy issues in urban development policies including all its impacts on the environment.

Experience has already been gained in the EU15. Sometimes this has been a bad one, for instance when the Structural Funds have not been used in the best way by promoting infrastructure projects without taking into account their impact on natural resources or climate issues [10]. On many other occasions it has been a good experience, for example when energy issues have been considered from the point of view of energy demand and promotion of local renewable resources rather than simply from that of the supply side via investment in grids and trans-national networks. This experience must be used by NMS to avoid the same mistakes and to integrate these aspects in the preparation of the projects, as requested by the rules of European Regional Development Funds.

However practices which should be the standard often still are the exception and a majority of new infrastructure or building projects as well as major renovation schemes are still carried out without any consideration being given to their energy impact in spite of the EU defined priorities for the control of energy demand and for limiting CO_2 emissions. Energy issues are not the most visible part of local planning compared to the construction or even the renovation of infrastructure and buildings. EE and energy saving measures are Community priorities which should be automatically included in the requisites of projects applying to a support from the Structural Funds.

The *RUSE* operation aims at improving the use of Structural Funds and other financial resources by municipalities and other stakeholders in charge of urban development issues in NMS and candidate countries thus progressing towards a better integration of sustainable energy issues (EE, renewable and distributed generation) in their projects [10].

To achieve the improvement of the use of Structural Funds, the RUSE operation has the following four main objectives:

- To make municipalities and related bodies in NMS and third countries more aware of existing Structural Funds related experience in European countries by disseminating information, promotion good practice and exchanging experience.
- To improve capacity building on energy issues in both individual bodies (municipalities) and collective structures (city networks, agencies, etc.).
- To prepare municipalities so that they can design projects dealing with their powers and responsibilities in a sustainable manner and to enable them to submit successful proposals under ERDF programmes (incl. INTERREG IIIA, URBAN, etc.). In other words, to help them integrate the concept of sustainable energy in urban plans and put them into practice.
- To influence national decision makers regarding the integration of energy issues in their programmes from the point of view of energy demand and the promotion of renewable energy, both of which are good methods for promoting local development.

Inter-regional cooperation is very powerful tool to overcome major market failure incomplete information. Therefore cross-border cooperation is more and more needed as it is very often through the local and regional levels that innovative policies are initiated or improved. And this is even more the case after the enlargement of the European Union with a key issue to be faced by the 10 NMS in the field of energy: How can the difference in energy performances between the most advanced countries in the EU-15 and the Central and Eastern European Countries be reduced as quickly as possible?

Local authorities need to become organized so that they may:

- identify the problems they have in common,
- share their experience and know-how,
- seek common solutions,
- obtain information, organize training sessions,
- put across their opinion and influence both European and national legislations, and
- set up joint projects.

To achieve this, they must also cooperate both at a "regional" level i.e. in the whole of the East European zone, in order to exchange experience and know-how on common problems and with their EU-15 fellow partners in order to make use of the experience that the Western municipalities have been able to build over these last decades and thereby take account of the *acquis communautaire*.

4.3. Use of SF for sustainable energy projects in Lithuania

As the concrete priorities of Structural Funds differ among the individual countries, in the following chapter we will present the short overview of possibilities in few new members states which are RUSE partners to apply SF for the financing of sustainable energy projects based on analysis of their Single Programming Documents (SPDs) and OPs.

Lithuanian GDP per capita is below 75% of the European Union's average and all territory of Lithuania is classified under Objective 1 and is able to draw on support from the EU Structural Funds. Lithuania is also able to draw funds from Objective 2 and Objective 3. The Lithuanian SPD and its supplement for 2004–2006 defines the main strategy for the use of SF in Lithuania and is the final result of internal negotiations within Lithuania between many different public and non-public authorities as well as other stakeholders, followed by an intensive period of negotiations with the European Commission. The rules of EU Structural Funds Projects Administration and Financing were approved by the Minister of Finance on 31 May 2004.

The Lithuanian SPD is being implemented by specific strategies described in five OPs:

- Development of social and economic infrastructure.
- Development of human resources.
- Development of productive sector and services.
- Rural development and fisheries.
- Technical assistance.

The main target or priority of Lithuanian SPD is to strengthen the preconditions for growth in long-term national economic competitiveness and to facilitate the transition to and development of a knowledge-based economy characterized by increasing GDP levels and strong employment growth, leading to higher living standards and increasing well-being for all Lithuania's inhabitants.

There are five OP in Lithuania for the period 2004–2006 within the CSF. The total amount of SF support for 2004–2006 in Lithuania is 895.1 MEUR. The global objective of the OP Development of social and economic infrastructure is to develop new and improve

existing physical infrastructure in order to promote economic growth and facilitate the free movement of goods, services and people and to ensure that development supported through the SPD is compatible with the principle of sustainable development. Its Community support should reach 347 million €.

The main objective of OP Development of Human Resources is to improve the skills base of the Lithuanian labour force and to ensure that the workforce is both flexible and adaptable. Another key objective is to upgrade skills and qualifications particularly amongst disadvantaged groups such as the unemployed and young people and to ensure that skills and competencies taught are relevant to labour market requirements. Its Community support should reach 163.8 million €.

The main priorities of OP Development of Productive sector and Services are to strengthen economic competitiveness by creating the necessary framework conditions for growth, the promotion of a favourable business environment and investment climate conducive to the growth and development of both existing businesses and new business start-ups. The overall target of this OP is to strengthen the process of economic restructuring which is already underway in Lithuania. Its Community support should reach 222.4 million €.

The main priorities of OP Rural Development and Fisheries is to is to modernize agricultural holdings and stabilize the demographic situation in rural areas by creating suitable conditions to live and work in the countryside. Other important objectives are to ensure professional qualification of people engaged in agriculture and to establish general conditions for market organization, improvement of fishing conditions and mitigation of social impacts of fishing activities cessation in Lithuania. Its Community support should reach 135 million €.

The Technical Assistance OP aims at ensuring the quality and effectiveness of all steps of preparation, evaluation, monitoring of the SF assistance at all levels of administration and public awareness about structural funds rising involving a wide range of partners in EU assistance planning and monitoring processes and also to ensure effective planning of future investment. Its Community support should reach 26.8 million €.

Sustainable energy projects can be implemented using the schemes from three OP:

- OP 1: Infrastructure.
  - Priority ID 1-2.2: Renovation of boilers and biomass or natural gas conversion.
  - Priority ID 1-2.3: Local and renewable energy sources.
  - Priority ID 1-2.4: Increase of EE in public sector
- OP 3: Productive sectors.
  - Priority ID 3-1.1: Implementation of new technologies.
  - Priority ID 3-1.12: Implementation of environmental measures
- OP 4: Rural development.
  - Priority ID 4-5.3: Investments to improve and rationalize the harvesting and logging of round wood and afforestation.
  - Priority ID 4-3.3: Investments into industries reprocessing agriculture products.

As regards investors preparing projects resulting in increased EE, energy savings or use of renewable and secondary sources, the possibility to acquire assistance through SF is primarily orientated to the *Measure ID 1.2 Ensuring of Energy Supply Stability,*

Accessibility and increased efficiency which includes three priorities relevant to sustainable energy projects:

- Renovation of boilers and biomass or natural gas conversion.
- Local and renewable energy sources.
- Increase of EE in Public Sector.

The main objective of measure 1.2 is to ensure stability, reliability, flexibility and accessibility of energy supply, increase of EE and to form a basis for the stable growth of national economy. This measure corresponds to the main targets of National energy strategy [11] and National Sustainable Development Strategy [12].

Particular sub-goals relating to EE or RES:

- Renovation of boilers and switching to other fuels in the combustion plants currently burning less environmentally friendly fuels (especially burning high sulphur content petroleum products).
- Increase the use of RES.
- Increase of EE in public sector.

Particular schemes for project submission:

- Conversion of combustion installations to biomass, natural gas.
- Adjustment of renovated boilers for CC.
- Installation of new or adjustment of existing energy generation sources to use RES and municipal waste.
- Implementation of new technologies including CC, use of RES, municipal waste.
- Renovation of buildings and heating installations.
- Maintenance and control of energy use in renovated buildings.
- Energy audits of buildings and infrastructure.
- Regional cooperation, R&D related to EE improvements and energy market development in national and regional levels.
- Feasibility studies, information dissemination, education, consultancy and scientific research in this field.

Eligible applicants are State institutions, Municipalities and their institutions, Public bodies, Subjects eligible under the condition of State aid provision: "Promotion of entrepreneurship, business & investments development": (1) to minimize support, (2) support to SME, (3) regional aid detailed eligibility requirement are defined during the call of proposals.

Eligible projects are those which ensure reduction of negative impact on environment, increase of reliability of energy supply, use or promotion to use RES, increase of energy use efficiency, implementation of advanced technologies.

The funds allocated for priority 1.2: ensuring of energy supply stability, accessibility and EE in Lithuania 2004–2006: 82.76 MEUR. The funds which have been distributed up to 01.05.2005 for three projects 1.24 MEUR. All these projects were aiming on EE increase in buildings in public sector.

Structural Funds have a great role to play in improving EE and the use of RES in Lithuania. Up to now, we remain quite far of what is expected despite some interesting examples opening the way for the future. Lithuania has adopted SPD for 2004–2006 which establishes the main strategic directions of EU structural funds use in Lithuania. Lithuanian Common programming document and its supplement for 2004–2006 establishes the main priorities, OPs and aims of structural funds use in Lithuania. The Lithuanian SPD is being implemented by specific strategies described in five OPs. Sustainable energy projects can be implemented using the schemes from the first OP: "Development of Infrastructure".

The situation with application for EU structural funds till 1 May 2005 was as follows in Lithuania:

OP 1: Development of Social And Economic Infrastructure

For measure ID 1.2 "Ensuring of Energy Supply Stability, Accessibility and Increased Efficiency" 82.8 MEUR was allocated but just 1.35 MEUR were distributed for three projects aiming at EE improvements in public buildings. Though for this measures totally 333 projects were submitted asking for 195.6 MEUR. The project proposals were submitted according these priorities:

- Priority ID 1-2: Development of energy networks—(21 projects submitted asking for 36.7 MEUR);
- Priority ID 1-2.2: Renovation of boilers and biomass or natural gas conversion (six projects were submitted asking for 10 MEUR);
- Priority ID 1-2.3: Local and RES (three projects were submitted asking for 0.5 MEUR);
- Priority ID 1-2.4: Increase of EE in Public Sector (303 projects were submitted for 148.4 MEUR).

For private sector 64 MEUR were allocated and project proposal for 47 MEUR were submitted. For public sector (this include just priority 1-2.4 "Increase of EE in Public Sector") 27.4 MEUR were allocated and project proposals asking for 148.4 MEUR were submitted. The distribution of project proposals and approved projects according priorities of Measure 1.2 and localization is presented in Table 1.

From the point of view of sustainable energy development the projects proposed for financing via EU SF indicates very low diversity and the absence of strategic approach in cities for implementing sustainable energy development strategies or cities strategic development plans including energy and other important sectors. For the next programming period it would be more useful to have cities sustainable energy development programmes as priorities in OPs with description of targets the spectrum of projects but without concrete definitions. In such a case the project packages including EE improvements in generation sector and end use sectors, deployment of RES, sustainable transport schemes, etc defined in cities sustainable development programmes, sustainable energy development or climate change mitigation programmes can be submitted for the financing from SF. Such approach would help to implement the targets of sustainable energy development strategies on local level using SF as viable financing measures.

4.4. Use of structural funds for sustainable energy projects in Czech Republic

Although, in the past ten years, the Czech Republic has made significant progress in becoming competitive in its relations with the outside world, particularly in relation to EU

Table 1
Submitted and approved projects in Lithuania according measure ID 1.2 ensuring of energy supply stability, accessibility and increased efficiency on 1 May 2005

Cities	Number of projects submitted	Number of projects approved	Measure ID 1.2 ensuring of energy supply stability, accessibility and increased efficiency				
			Private sector			Public sector	
			Priority ID 1-2.1: Development of energy net works	*Priority ID 1-2.2:* Renovation of boilers and biomass or natural gas conversion	*Priority ID 1-2.3:* Local and renewable energy sources	*Priority ID 1-2.4:* Increase of energy efficiency in public sector	
			Submitted	Submitted	Submitted	Submitted	Approved
Alytus	21					21	
Kaunas	71		4	2	1	64	
Klaipeda	30		1		1	28	
Marijampole	15		1			14	
Panevezys	27		3	3	1	20	
Siauliai	42		3			39	
Taurage	19		1	1		17	
Telsiai	24	1	2			22	1
Utena	11		2			9	
Vilnius	73	2	4			69	2
Total	333	3	21	6	3	303	3

Member States, it is still below 75% of the European Union's average Gross Domestic Product. This means that its cohesion regions (Nomenclature of Territorial Units—NUTS II), with the exception of Prague, are classified under Objective 1 and are able to draw on support from the EU's Structural Funds.

The contribution of the Funds shall be a maximum of 75% of the total eligible cost and, as a general rule, at least 50% of eligible public expenditure in the case of Objective 1. Where the regions are located in a Member State covered by the Cohesion Fund, which is the case for the Czech Republic, the Community contribution may rise, in exceptional and duly justified cases, to a maximum of 80% of the total eligible cost.

The CSF for the Czech Republic 2004–2006 is the final result of a long period of preparations and internal negotiations within the Czech Republic between many different public and non-public, national, regional and local partners followed by an intensive period of negotiations with the European Commission. This document constitutes the basic strategy for socio-economic development of the cohesion-regions Central Bohemia, North-West, South-West, North-East, South-East, Central Moravia and Moravia-Silesia for the period 2004–2006. They all belong to the regions within the European Union with a Gross Domestic Product (GDP) per capita below 75% of the average of EU-15 and are therefore eligible for support under Objective 1. The region of Prague does not fulfil this criterion, and is not covered by the CSF; this region will however be able to draw funds from Objective 2 and Objective 3.

The global strategy of the CSF is being implemented by specific strategies described in five OPs. Strategic plans for major projects concerning Transport and Environment are implemented by the Cohesion Fund, outside the CSF but covering the whole territory of the Czech Republic.

The Community Initiatives INTERREG, aimed at cross-border cooperation, and EQUAL, aimed at combating social exclusion, are also available to the Czech Republic, but are also not covered by this CSF. The CSF for the Czech Republic is based on the National Development Plan (NDP) covering a strategy for economic and social cohesion, including a problem analysis for Prague. The preparation for the NDP began in 1999 when the first draft of the NDP was produced by the Government of the Czech Republic. The basic version of the NDP was several times updated and amended partly on the basis of comments received from the European Commission.

The Government approved the National Development Plan by Resolution No. 1272/2002 of 16 December 2002. In early 2003 the Government reacted to a recommendation from the European Commission to reduce further the number of the prepared programmes and decided to merge the OPs Transport and Environment into the new OP Infrastructure (Resolution No. 149/2003 of 12 February 2003).

By the end of June 2003, the Commission informed the Czech authorities about its comments on the NDP. The formal negotiations opened on 3 July 2003 in Prague, followed by three technical meetings to discuss several specific issues more in depth. After an intensive period of negotiations the Czech Republic and the European Commission were able to agree on the main elements of assistance during a second formal negotiation meeting on 12 September 2003 in Brussels. This CSF is a reflection of the outcome of these negotiations.

The Czech Republic has prepared five OPs for the period 2004–2006 within the CSF. The global objective of the OP Industry and Enterprise is to contribute to a competitive Czech business sector on the European common market with a high

labour productivity and efficient production. Its Community support should reach 261 MEUR.

The OP Infrastructure contributes to the development of the second priority axis—Development of Transport infrastructure—and the fourth priority axis—Protection and improvement of the environment—of the CSF. Its Community support should reach 246 million €.

The OP Rural Development and Multi-Functional Agriculture is in line with the fifth priority axis of the CSF "Rural development and Agriculture" and will contribute to a part of the specific objectives" creating conditions of the business environment" and "improvement of the infrastructure quality", while at the same time supporting the horizontal objectives of "sustainable development" and "balanced development of regions". Its Community support should reach 174 MEUR.

The OP Human Resources Development caters directly for the third CSF priority axis "Human Resources Development" and moreover for two of the three specific objectives that have been identified for the shortened programming period 2004–2006. Its Community support should reach 319 MEUR.

The Joint Regional Operational Programme (JROP) contains the development priorities of seven cohesion regions eligible for support under Objective 1. The JROP is based on a joint development strategy with the regional differences being reflected by different financial weights to priorities and measures in the individual regions. Its Community support should reach 454 MEUR.

As regards investors preparing projects resulting in increased EE, energy savings or use of renewable and secondary sources, the possibility to acquire assistance through structural funds is primarily orientated to the existing support resources, i.e. programmes of the State Environmental Funds and the Czech Energy Agency (CEA). Together with the agency CzechInvest, CEA has become the implementation agency of the Operation Programme Industry and Enterprise, in the area delimited by measure N° 2.3 "Energy Intensity Reduction and Use of Renewable Energy Sources".

To fulfil this activity, the following two programmes have been prepared:

- Programme of Energy Intensity Reduction.
- Programme of Renewable and Secondary Energy Source Use.

Support from either of these programmes can only be received by business subjects that:

- fall within the category of small and medium-sized enterprise according to the EU definition,
- do business in the sector of the processing industry and industrial services (in the case of the latter programme, also producers of energy from RES), and
- maintain double-entry accounting.

Ensuing from the above-mentioned preconditions is the fact that producers and distributors of long-distance heat, electricity and gas and other subjects outside the processing industry are excluded from support. Neither will projects that would serve for the public sector (heating of residential houses, schools, health facilities, etc.) be entitled to assistance. The maximum level of support can be up to 46.6% of acknowledgeable project costs, a maximum of CZK 30 million or about 1 MEUR per project.

Acceptance and selection of projects will take place in such a manner that regional CzechInvest representations should receive applications from applicants for support, check their formal requisites and completeness. Subsequently, the Czech Energy Agency will check the applications in terms of factual content, process and evaluate the monitored indicators, the selection criteria of the project's acceptability and submit appropriate applications with a recommendation or non-recommendation to the Selection Committee. If the Selection Committee recommends a project's implementation, it will also propose the specific level of subsidy to the Management Authority.

However, the precondition will be that the applicant for support from measure No. 2.3 must not simultaneously apply for and be a final user of the Infrastructure Operation Programme, measure No. 3.3 "Improvement of Air Pollution Control Infrastructure" which is also can be used for the financing of sustainable energy projects.

The situation with application for EU structural funds for sustainable energy projects financing till 1 May 2005 was as follows in Czech Republic:

The support from OP "Industry and Enterprise" *Measure No. 2.3 "Energy Intensity Reduction and Use of Renewable Energy Sources"* was allocated for four projects totalling to 219 thou EUR.

The support from OP "Infrastructure" Measure No. 3.3 "Improvement of Air Pollution Control Infrastructure" was allocated to eight projects totalling to 6.27 MEUR. Therefore the total amount of support already allocated for renewable energy projects in Czech Republic is about 6.5 MEUR. The distribution of projects between priorities and regions is presented in Table 2.

As one can see from Table 2 just one project on RES and three projects on EE improvements were approved in Czech Republic. Eight projects related with improvement of air pollution control infrastructure aimed at dangerous waste incinerator modernization, hospital waste incinerator reconstruction, creation of energy self-reliable village, reconstruction of district heat system and heat pump heating system installation. One project aiming at wood pellets boiler house installation was financed under the OP 3

Table 2
Submitted and approved projects in Czech Republic according measures ID 2.3 "Energy intensity reduction and use of RES" and ID 3.3 "Improvement of air pollution infrastructure" on 1 May 2005

Regions	Number of projects approved	ID 2.3 "Energy intensity reduction and use of RES"		ID 3.3 "Improvement of air pollution infrastructure"
		Priority 2-3.1 "Energy efficiency"	Priority 2-3.2 "Renewables"	
Karlovarsky kraj	1	1		
Vysocina	3	1		2
Jihomoravsky kraj	2		1	1
Jihocesky kraj	1			1
Stredocesky kraj	1			1
Moravskolezsky	3			3
Zlinsky kraj	1	1		
Total	12	3	1	8

Infrastructure though the financing for this can be provided by OP 2 Measure 2.3 "Energy Intensity Reduction and Use of RES". The distribution of projects in the territory of Czech Republic is also quite restricted. More attempts are needed to promote use of SF for sustainable energy projects financing in Czech Republic.

4.5. Use of SF for sustainable energy projects in Poland

The distribution of the Structural Funds between the Member States is based on the three Objectives. The whole of Poland is classified under Objective 1, which aims particularly to "narrow the gap between the development levels of the various regions" and help areas lagging behind in their development. A comprehensive document defining Poland's socio-economic strategy in the first years of Poland's membership in the European Union is The National Development Plan 2004–2006.

In order to programme Community assistance and to ensure its effective implementation, Poland has prepared the National Development Plan 2004–2006. It was adopted by the Council of Ministers on 14 January 2003. The plan lays down priority objectives, measures, and the institutional and financial framework of structural projects Poland plans to implement in 2004–2006. The National Development Plan and OPs form the basis for negotiations of the CSF for Poland with the European Commission planned for 2004–2006.

The total of public means used in implementation of NDP 2004–2006 is 14 891.5 MEUR, where 11368.6 MEUR (76.3%) will come from the Community Funds. From the amount of 11368.6 MEUR, 7635.3 MEUR will come from the Structural Funds, and from this amount 7320.7 MEUR will be used for the implementation of the CSF.

The document specifies directions and levels of support from structural funds and the Cohesion Fund. The Polish National Development Plan 2004–2006 defines a number of development axes that are covered in detail in Sectoral OPs.

On the basis of the National Development Plan, a Member State negotiates the CSF with the European Commission. The CSF, as a result of a joint agreement between the European Commission and a Member State, provides guidelines and levels of support from structural funds towards the implementation of development initiatives. The CSF is broken down into priorities and implemented via one or a number of OPs.

On 23 December 2003, the CSF was adopted by the Council of Ministers. The CFS will be formally approved by the European Commission in May 2004 after Poland's accession to the EU, but the current form of the document may be considered final.

The CSF for Poland, in the period 2004–2006, will be implemented through five mono-fund sectoral OPs:

- SOP Improved Competitiveness of Enterprises—17.8% of the all means (1300 MEUR).
- SOP Human Resource Development—17.3% of the all means (1270.4 MEUR).
- SOP Transport–Maritime Economy—8.6% of the all means (627.2 MEUR).
- SOP Restructuring and Modernization of the Food Sector and the Development of Rural Areas—14.4% of the all means (1055 MEUR).
- SOP Fisheries and Fish Processing—2.4% of the all means (178.6 MEUR).

- Integrated Regional Operational Programme (IROP)—39.2% of the all means (2869.5 MEUR).
- OP Technical Assistance—0.3% of the all means (20 MEUR).

Sectoral OPs are prepared and implemented by the relevant ministries, defining detailed development plans for entire socio-economic sectors. The structure and contents of SOPs result directly from objectives and strategies laid down in National Development Plans.

The management of OPs allocating funds to educational projects, i.e. SOP Human Resource Management, SOP Improved Competitiveness of Enterprises and IROP, is entrusted to the Ministry of Economy, Labour and Social Policy as a Managing Authority. Regarding these programmes, the Managing Authority responsible for the programme will delegate the management of specific priorities and measures to other central government units, the relevant departments of ministries and central offices, serving as Intermediate Bodies.

Final beneficiaries/implementing authorities are mentioned in programme documents (OPs and programme complements) as bodies responsible for contracting project implementation with the project provider.

The programme supporting sustainable development in Poland is IROP. One of the IROP's underlying assumption underlying assumptions about environmental protection stems from a brief that natural resources are an important factor determining regional development and standard of living. These considerations are taken care of under the following measures:

- Priority 1—Development and modernization of infrastructure to enhance the competitiveness of regions.
  - Measure 1.1 Modernization and expansion of the regional transport system.
  - Measure 1.2 Environmental protection infrastructure.
  - Measure 1.6 Public transport Development in the Agglomerations.
- Priority 3—Local Development
  - Measure 3.1 Rural areas.
  - Measure 3.2 Areas undergoing restructuring.
  - Measure 3.5.Local infrastructure in rural areas.

Analysis of projects submitted up to 1 May 2005 for the financing from IROP measures which are aiming at support of sustainable energy projects is presented in Table 3.

As one can see from Table 3 Poland as large country distinguishes from other NMS analysed in this article with big quantities of submitted projects submitted for SF funding and with huge amounts of sums requested and allocated for these projects. Another interesting feature is that Poland does not have any special measure in its OPs as in case of Lithuania (Measure 1.2 in OP1) or Czech Republic (Measure 2.3 in OP2) which is specially established for the sustainable energy development projects. Therefore even it was not possible to carry out an analysis of sustainable energy projects submitted and approved for the financing from SF. Such situation makes preparation and submission of sustainable energy projects especially difficult in Poland. In the next financing period the special measure aiming at EE improvement and renewable energy source use should be created in Poland (in IROP) seeking to promote development of sustainable energy projects and ensures their financing from SF.

Table 3
Submitted and approved projects in Poland according OP 6 Integrated regional operational programme priority 1. "Upgrade and modernisation of infrastructure aiming at regions' competitiveness strengthening" and Priority 3 "Local development" on 1 May 2005

Measures	*Operation programme ID 6* Integrated regional operational programme			
	The number of projects		Amount	
	Submitted	Approved	Requested	Allocated
Priority 1—Development and modernization of infrastructure to enhance the competitiveness of regions				
Measure 1.1. Modernization and expansion of the regional transport system	473	99	984 MEUR	207 MEUR
Measure 1.2. Environmental protection infrastructure	368	50	723 MEUR	105 MEUR
Total	841	149	1.71 BEUR	305.8 MEUR
Priority 3—Local development				
Measure 3.1. Rural areas	2749	312	859 MEUR	101 MEUR
Measure 3.2. Areas undergoing restructuring	570	41	194 MEUR	11 MEUR
Measure 3.5. Local infrastructure in rural areas	1716	128	723 MEUR	43 MEUR
Total	5035	481	1.8 BEUR	155 MEUR

5. Conclusions

1. EU Structural Funds is a good tool which can be used in NMS to attract investments for the financing of new technologies, including the use of RES and EE improvements (renewable energy projects) which are doubly underpowered by energy markets and needs state support.
2. EU Structural Funds are being distributed in NMS based on priorities of SPD prepared my member states and approved by EC. There are four main OPs in SPDs of three new members states (Lithuania, Czech Republic and Poland) reviewed in this paper: Infrastructure; Human Resources; Productive Sector; Rural or Agricultural development and fisheries. They are very similar for Czech Republic and Lithuania. In Poland the structure of SPD includes the separate OP for maritime transport and separate OP for fisheries. Poland has also IROP.
3. The OPs which can be used for support of activities in the area of RES and EE improvements are similar in three NMS: infrastructure, productive sectors, agricultural and rural development. However, the structure of priorities in OPs is quite similar among these countries the similar projects are being financed from different OPs.
4. Particular subgoals related to EE or RES in OP "Infrastructure" are the same in three countries: increase use of RES; EE improvements in public sector and air protection. Particular subgoals relevant to sustainable energy in Productive sectors are also quite similar between countries reviewed: development of new technologies and implementation of environmental measures; the approximation of industrial energy demands to the EU levels through EE improvements; increase use of RES and local fuels by promoting

regional business. The subgoals relating to EE or RES in Agriculture sector are: improve the harvesting and logging of round wood and biomass; investments into raps conversion to biofuels; financing of facilities for the use of alternative energy sources (biomass) for own consumption of energy; investments into use of alternative energy sources.

5. Municipalities in NMS could play a considerable role by promoting sustainable energy because local authorities are fulfilling their functions in the energy sector via a number of roles. The problem is the lack of information and the lack of investments at local level. The lack of investments can be overcome by using EU Structural Funds. The main problem is the provision of information on possibilities to use SF for the financing of sustainable energy projects in each country and good practice case studies conducted in other countries.
6. The exchange of practices in development and financing of sustainable energy projects and dissemination of good practice case studies is the key to promote the development of such projects in NMS. This is the main measure to combat with incomplete information or asymmetry of information caused by market failures.
7. An INTERREG IIIC Programme project *RUSE* has been launched in order to transfer experience of EU15 to the NMS in field of sustainable energy projects, financed by SF. Therefore the exchange of experiences promoted by several RUSE activities represents a very important EAV.
8. There are a lot of good practices case studies developed in European cities and soundly integrated in their strategic development programmes aiming at financing of sustainable energy projects however the use of these examples projects is complicated in NMS. The analysis of submitted and adopted sustainable energy projects in NMS shows the slow process of SF resource application for sustainable energy projects (1.24 MEUR distributed in Lithuania, 6.27 MEUR—in Czech Republic), very low diversity and the absence of strategic approach in cities for implementing sustainable energy development strategies or cities strategic development plans including energy and other important sectors. Poland even does not have a special Measure for sustainable energy projects not allowing evaluation of submitted sustainable energy projects.
9. For the next programming period it would be more useful to have cities sustainable energy development programmes as priorities in OPs with description of targets the spectrum of projects. In such case the project packages including EE improvements in generation sector and end use sectors, deployment of RES, sustainable transport schemes, etc. defined in cities sustainable development programmes, sustainable energy development or climate change mitigation programmes can be submitted for the financing from SF. Such an approach would help to implement the targets of sustainable energy development strategies on local level using SF as viable financing measures.

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